



## ***FY 2017 USGS/NEHRP (G15PG00129) Report***

*Geochronological Analyses at the Center for Accelerator Mass Spectrometry, Lawrence Livermore National Laboratory, in support of NEHRP researchers*

In FY 2017, the Center for Accelerator Mass Spectrometry of the Lawrence Livermore National Laboratory (LLNL) provided radiocarbon ( $^{14}\text{C}$ ) and cosmogenic in situ beryllium-10 ( $^{10}\text{Be}$ ) analyses in support of the USGS neotectonic research activities under the National Earthquake Hazards Reduction Program (NEHRP).

Accelerator mass spectrometric  $^{10}\text{Be}$  analyses were performed on BeO targets that were submitted pre-packed in stainless steel cathodes and prepared by the NEHRP researcher, at their home institution.  $^{10}\text{Be}$  analyses were standardized relative to the 07KNSTD standard series (cf. Nishiizumi et al., Nuclear Instruments and Methods in Physics Research B 258 (2007) 403–413) and were measured to ~3% precision. The facility received and analyzed three (3) targets for  $^{10}\text{Be}$  analysis from Dr. Kimberly Blisniuk of San Jose State University.

Radiocarbon analyses in support of NEHRP researchers were made for Drs. Joshua Roering (University of Oregon), Gordon Seitz (California GS), and Ashley Strieg (Portland State University). In the case of Dr. Seitz, he participated in sample pretreatment and preparation. For Dr. Roering and his colleague Dr. Ray Weldon, CAMS hosted a University of Oregon undergraduate student who participated in sample pretreatment and preparation. Eleven (11) analyses were made for Dr. Roering, seven (7) analyses were made for Dr. Seitz, and sixteen (16) analyses for Dr. Strieg: ie., a total of thirty-four (34) analyses. These numbers do not include backgrounds and process standards. Twenty-one (21) of the submitted samples were of sufficient size to have sample specific  $\delta^{13}\text{C}$  via IRMS determined. These results were reported relative to V-PBD, in conventional per mil notation.

Radiocarbon results were reported according to the international radiocarbon standard set forth in Stuiver and Polach (1977), and included a matrix specific background correction, and  $\delta^{13}\text{C}$  normalization. Samples that did not have a specific  $\delta^{13}\text{C}$  analysis were estimated as per Stuiver and Polach (ibid.). The reports (sent to the researchers) included fraction modern, conventional radiocarbon years, and the 1-sigma standard deviation error of the analysis.

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